EDIBLE WILD PLANTS
OF THE HIMALAYAS

by
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Foreword

The troops on our Northern and Eastern borders have to be trained for mountainous terrain and jungles and may have to operate in small parties in difficult and inaccessible areas. These areas, generally, have poor communications and are cut off from habitation.

It is with a view to help troops operating in such areas that this General Staff publication on “Edible Wild Plants of the Himalayas” is published. Some 450 different plants have been described in the pamphlet and a knowledge of these will provide a vast choice to meet the primary needs of hunger.

The publication is based on information and a draft given by Sarvashri RATTAN LALL BADHWAR, Director, Biological Research, Forest Research Institute and College, DEHRADUN and ROBERT RICHARD FERNANDEZ, Senior Research Officer, Minor Forest Products Branch, of the same Institute. This is the result of a long and patient research of the flora and fauna of the Himalayas by these two officers. This has been gifted by them to the Armed Forces.

Lieutenant General

Moti Sagar

Chief of the General Staff

Jan’ 64
Preamble

The Authors produced this work in 1964 in the aftermath of the 1962 Operations as a gift to the Army. It was designed as an aid to training troops for survival when operating in small parties in otherwise remote, inaccessible areas.

The Book was thus pitched at the level of those who may not have been initiated in the formal study of plant life and has, therefore, been structured to make it usable by them. The ‘Introduction’ explains in ordinary terms the various aspects of a plant that aid identification. Index to local names, english names relates comprehensively to the various local names and dialects by which the plants maybe known in the diverse areas in the Himalayas. Recognizing its usefulness, the Army initially published it as a General Staff Training Publication. Conditions have since then significantly changed and the Army has now allowed it for wider usage.

The Book will amply serve the purpose of mountain and jungle lovers, hikers, trekkers, explorers and holiday makers to take an informed and rewarding interest in the environment and the bounties of nature that so amply endow such areas.

V. Badhwar
(Retired)
Major General
January 17, 2010
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Foreword by Lieutenant General Moti Sagar, Chief of the General Staff

Preamble by Major General (Retired) V. Badhwar

Introduction

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Introduction

Shown below is a young mango plant (seedling). Such a plant has a system of \textit{roots} below ground, and \textit{stem} and \textit{leaves} above ground. The distinction into stem, leaves and roots is a recognised essential feature of all higher plants, nevertheless, occasionally the differentiation may never be sharply marked. Thus turmeric, onion, or cardamom plants are apparently a bunch of leaves springing directly from ground and show hardly any stem above ground; asparagus or cactus are known to be destitute of leaves. While as a rule plants are rooted to the ground, a few plants are so to say, aerially situated permanently nesting on trees and other suitable support, with their roots clasping the host or
freely hanging in ‘air. Further, growing parasitically on host plant the mistle-toe neither has normal roots nor direct ground contact. Then, there are also what are called’ water plants’ that are either totally submerged or remaining floating with their roots alone immersed in water. It is a thrilling experience to observe the emergence of the embryonic root and then of shoot, say from a germinating gram, and the gradual unfolding of leaves in seedlings.

Classifying the plant forms under trees, shrubs, or herbs, etc., is helpful to a considerable extent, for their study. We call the tall or gigantic woody-stemmed species as trees, e.g., mango tree, and walnut tree; those plant, of about the height of oleander (nerium) or coffee plant, which are often bushy lacking in a prominent central stem, are called shrubs. Small plants such as coriander and pudina with tender stems possessing little or no wood are known as herbs. Species with very long but slender stems and by themselves too week to stand freely upright, often climb high up depending on trees, walls, etc., for support or just keep creeping on the ground. Such plants come under the grouping of climbers throughout this book.

Interest in leaves in plant identification is well known. They often exhibit specific forms varying from the very narrow, strap-shaped and parallel-edged type as in grasses, to circular type as in lotus, with several integrating forms, such as lance-shaped (mango leaf vide supra), egg-shaped (banyan leaf) and heart-shaped (peepal or betel leaf) types. A leaf described as elliptic has essentially an oval outline but is broadest at the middle narrowing down to either extremities to sharp angle. Leaves that are only a few times longer than broad with parallel edges and with rounded base as well as tip are termed oblong. The mango leaf may further be described as a green-coloured flat expansion (leaf blade) spread out at the end of a rod-like stalk or petiole. Leaves with these essential features of a simple flat ‘blade’ on a cylindric stalk, characterise great many kinds (species) of plants. Further, the margins or edges of leaf blade are known to be occasionally cut into teeth, or notched into lobes, resulting in a toothed- or lobed-leaf respectively. Also known is compound leaf which is described to be composed of two or more separate leaf-like parts called leaflets, which are articulated at one point (e.g., semul leaf), or are often arranged in the manner of barbs in a feather (e.g., curry leaf and coconut palm leaf).

The angle of attachment between leaf and stem is known as leaf axil, a term applied often to denote the position notably of flowers on the plant. Thus axillary flower means, the flower is borne in the axil of leaf.

Flowers, the highly specialized reproductive organs of plants, are so very familiar to us that it should never be difficult to get thoroughly acquainted with the different parts that make up a complete flower. When a rose flower is superficially searched one discovers:

(i) The outermost 5 green lobes (called sepals), arranged in a regular circle and collectively known as calyx, followed by.

(ii) One or more sets or rows of the brightly coloured parts known individually as petals while collectively as corolla. Corolla is the most conspicuous part of rose and most other flowers.
(iii) Next to the corolla, are the male sex organs designated as stamens. Each stamen consists of a thread-like sterile stalk called filament with a swollen fertile part, called anther, at the tip; anther produces the fertilizing powder-like pollen that ultimately gives rise to male sperm.

(iv) Following the stamens in the very centre of rose flower is a bunch of female sex organs known as carpels each distinguishable into a basal part called ovary produced above into a thread-like structure or style with a broad tip called stigma, the recipient of pollen; ovary contains each an ‘egg’ known botanically as ovule.

Viewed from above, what appears as a minute brush in the centre of a rose flower comprises thready carpels and stamens bordered by the large showy petals supported on the calyx.

Rose is an example of bisexual flower, as it possesses both stamens and carpels. Flowers are known as unisexual when they contain either only male or only female organs; in a male flower, carpel is absent or non-functionary being abortive and vice versa in a female flower. Flowers of red-gourd (kaddu), maize or castoroil are unisexual, however the male and female flowers both are borne on one and the same individual plant. A complete sex differentiation is nevertheless known to be characteristic of a few flower-bearing species such as the date palm where an individual tree is either male or is female and therefore producing either only male or only female blossom respectively.

Flowers may be borne singly, or more often in a cluster, the latter is known as inflorescence in botanical language. Often leaf-like green accessory parts known as bracts or/and bracteoles are associated with flowers or inflorescence.

Normally the ovary alone is known to undergo rapid developmental changes soon after the fertilization and get wholly transformed into a novel organ the so called fruit, such as the mango. Often extracarpellary elements are also known to develop in association with the fruit, occasionally imparting a distinctive disguise to the latter. Thus in case of apples and pears, it has been established that the tip of the flower stalk which becomes swollen and fleshy, engulfs the ovary in the ripening process, and forms the edible portion of these fruits. The well-known fig is derived from an entire flower cluster or inflorescence, the whole transforming into one single ‘fruit’. This last type to which mulberry fruit also belongs may be recognized in a strict sense as multiple type fruit. Occasionally also the free carpels of a single flower grow into separate fruit-like parts known scientifically as fruitlets.

Fruits are important aids of plant identification and often are of wide economic interest. There are several kinds of fruits and hence it is necessary that, for their correct recognition, a clear distinction of the different parts (such as skin, fleshy or juicy part and hard ‘stone’ containing seed in a ripened mango), that characterize a fruit, has to be made. Fruits which are of a fleshy nature of the mango type containing woody seed vessel or stone (endocarp) are known as drupes. Cherry, plum, and apricot are other popular examples of drupe. Tomato, brinjal, grape or banana (which may be described to possess a soft undifferentiated flesh or pulp), being devoid of the hard inner layer or stone, are classified as berries (singular berry) in the botanical sense of
the term. All fruits on the other hand do not become fleshy. Thus the hard-shelled, l-seeded acorns and buckwheat referable as true nuts, are a type of fruits of non-fleshy or dry nature. In common usage however, the terms berry and nut have been indiscriminately used, which should not be confused with their correct application in this book. It is of common knowledge that certain fruits such as bhendi on reaching maturity soon so to say, start drying even while still on parent plant, till finally they burst open for delivery and an effective disposal of seeds loosely contained in them. This type of fruit is recognized as capsule.

Seed is a post-fertilized matured ovule and is best known to protect the dormant embryo or baby plant contained in it. It is the embryo that sprouts when seed is sown, and grows into an offspring (mango seedling vide supra). In addition to embryo, a seed of the kind of mango or gram possesses one pair of fleshy parts (seed leaves or cotyledons), occupying fully the seed cavity within the leathery skin called seed coat. The cotyledons together with the attached minute embryo lying between them, constitute seed-kernel. The kernel of castor-oil seed comprises, on the other hand, an oily flesh or albumen called endosperm in the middle of which are lodged the pair of thin papery cotyledons and minute embryo. Betel nut is characterised by a single cotyledon which is but a minute body; the major part of the seed is occupied by the familiar endosperm chewed with pan. In a few cases such as lotus, nutmeg and litchi, an additional flesh termed aril grows over the seed; thus mace of commerce is the botanically recognised aril of nutmeg.

As generally recognised seed is a separate entity. Occasionally as in the l-seeded grain of maize, the fruit wall and seed getting completely united, remain unseparable one from the other and what is really a fruit is commonly mistaken for seed. Their correct identification can however be readily fixed from floral vestiges associated with them. Sunflower ‘seed’ is thus actually a fruit contrary to what it is wrongly called and its distinction is evident from the scar of fallen style present at its tip.

Plants include a great variety of forms, and it would be extremely difficult to get their acquaintance without arranging them into groups or classes. Those characterised by flowers are referred to a single group known as Flowering Plants which also possess, in addition, the most highly developed system of roots, stem and leaves of the type described above. Nearest relatives of flowering plants are cone-bearing plants, such as pines, and cycads. Plants are also known to us as ferns, mosses, mushrooms, moulds and seaweeds, which so to say do not produce flowers. In a general way, as one gets scientifically acquainted with the major plant groups, one will recognise more and more the differences or the similarities presented by them: a group of plants produce flowers (e.g., rose), the fern does not, though both rose as well as fern have stem, roots and leaves. Mosses are much more delicate plants with only stem and leaves but devoid of roots; mushrooms, and seaweeds are still more simple possessing no true stem, leaves or roots. There is thus an infinite variety and profusion of forms present in the kingdom of plants. We know at least 200,000 kinds of flowering plants and the number of lower plants–ferns, mosses, fungi, algae, bacteria–not likely to be smaller. Bacteria which are amongst the tiniest forms of plant life, are so small that they can be seen only when magnified through a microscope. Moulds, mildews and mushrooms together constitute a large group of lower plants known as fungi. Some
of the mushrooms like the morel or morchella (guchhi) and agaricus (dhingri and khumb) are amongst the most prized edible articles and are sold at very high prices in the market.

Flowering plants, on the other hand supply almost all the variety of greens, roots, leaves, flowers, fruits and seeds that we eat every day for our sustenance. Most of these vegetables and fruits are the produce of long continuous cultivation, but among wild plants occurring in the Himalayas there are over 500 such which could provide a vast choice to satisfy the primary needs of hunger and taste. These as well as the few conifers and ferns have been dealt with in this work under their Latin names which alone have uniform application and are the only internationally understood plant names. Well-known English names have also been added. Further, Indian Names of plants by which they are known in the region have been included in every case.

In order further to facilitate the recognition of plants, the species dealt with in the book have been combined in botanical families (kul) that are broken into genera (vansh), because plants of a family closely resemble each other in many respects, while those of a genus still more so.